

The Food Safety Risk of Venison Products Associated with Chronic Wasting Disease (CWD) in Wisconsin Deer

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The detection of CWD in deer in an area of southwestern Wisconsin has focused a great deal of attention on this disease, and raised questions about the potential human health risks associated with Wisconsin venison. Hunters want to know if there is a health risk from consuming venison. Meat processors want to know if there is any risk to the safety of their plant's environment if they handle venison.

At this point in time these questions cannot be answered with "absolute certainty." There really is very little absolute certainty in most life situations since science is continually uncovering new information. However, many things are currently known about the potential CWD risk to humans, and some recommendations are available to minimize that risk. This fact sheet summarizes the food safety related aspects of CWD. Since other fact sheets have provided in-depth background on and descriptions of the disease and its possible cause, those issues will only be summarized briefly in this article.

Some Background on CWD: CWD is a nervous system disease which affects deer and elk (usually over 18 months of age) causing weight loss and various neurological changes (such as altered head and ear orientation, an unsteady gait, decreased fear of people), progressing to eventual animal death. It is a member of a family of related diseases known as transmissible spongiform encephalopathies (TSEs), each afflicting specific hosts (sheep, cattle, deer/elk, mink, humans).

The suspected cause of TSEs are a number of unique strains of infectious, self-propagating proteins called prions, an abnormal form of a normal protein found in many tissues. In affected animals the presence of the prions cause normal nervous system protein to be converted to the abnormal prion type, resulting in brain lesions which create the neurological changes associated with the disease. Different prions are associated with each type of TSE. CWD appears to spread directly by animal-to-animal contact, and indirectly by contact of animals with highly contaminated environments. In infected animals, prions have been found in nerve tissue (brain, spinal cord), lymph nodes and spleen, but have not been found in meat (muscle tissue). Prions are extremely resistant to destruction by chemical or physical methods (such as heating).

The finding of deer with CWD in an area of southern Wisconsin was first made during the 2001 hunting season. It is likely that it has been in the state, but undetected, for a number of years. Random, limited tests performed on deer harvested in other areas of the state in 2001 were negative for the disease (as were similar-random tests on deer harvested in 1999 and 2000).

CWD was first identified in captive mule deer in Colorado in 1967, and in free-ranging elk and deer in an area of Colorado in 1981. It has since been found in several other states west of the Mississippi River, and in one Canadian Province.

Why the Concern About CWD and Human Health: If CWD is a TSE disease of deer and elk, why is there a concern for human safety? A human TSE exists, and it is termed Creutzfeldt-Jakob Disease (CJD). It occurs world-wide, generally in older individuals (usually over 65 years of age), at the rate of about one case annually per 1,000,000 people. It had been previously thought that each distinct naturally occurring TSE only existed within a species; that is the disease could not cross the “species barrier,” and affect other types of animals or humans. However, in the wake of the bovine spongiform encephalopathy (BSE - “Mad Cow Disease”) outbreak in British cattle in the 1980's and 90's, approximately 125 humans have contracted what is called “new variant CJD,” differing from the traditional form in that it occurs among younger adults and produces somewhat different pathological changes in nervous tissue than classical CJD. One possible explanation for the appearance of the nvCJD is that it was contracted by consuming beef nervous tissue containing the infectious prions, which were able to affect people. Although there is currently no evidence that this occurs with CWD, this threat is the basis of the potential food safety risk associated with venison from deer or elk having CWD.

What Does This All Mean for Venison Safety? Given the above facts about the disease in deer and the potential (hypothetical) health implications for humans, and knowing that almost nothing in our lives can attain risk-free “absolute safety,” what available information exists to help hunters and processors make informed choices about venison safety? Consider the following:

- § The World Health Organization (WHO) and the U.S. Centers for Disease Control and Prevention (CDC) have found no scientific evidence to date that CWD can be transmitted to humans.
- § No link has been found between CWD in deer and elk and Creutzfeldt-Jakob Disease (CJD) in humans.
- § Infectious prions haven't been found in meat (muscle tissue) of BSE-infected cattle or scrapie-infected sheep (scrapie is a TSE of sheep). These agents have been isolated from brain, spinal cord, eyes, lymph nodes, tonsils and spleen.
- § CWD infected deer and elk have existed in a geographic pocket on the Colorado/Wyoming border for over 30 years, with no apparent association of CWD with other TSEs of man or other animals. The incidence of the human form of this disease (CJD) has remained level at the expected annual rate of about one case per 1,000,000 people in that area. This includes individuals who have slaughtered deer and elk, and workers in research facilities studying CWD.
- § Surveillance information collected thus far in Wisconsin has found CWD-infected animals only in the area west of Madison (infection rate of about 3% among deer harvested). Deer tested in all other regions of the state have not been found infected with CWD. A total of approximately 1,000 deer were tested in 1999, 2000 and 2001, with about 200 coming from the current CWD zone in southern Wisconsin, and about 800 from other areas of the state. A much larger surveillance sampling of deer from throughout the state during the 2002 hunting season will provide additional information on the distribution of infected animals.

Other Safety-Related Observations:

- § Scrapie has been present in sheep for over 200 years, with no evidence of transmission to

humans via the meat.

- \$ Incidence of CJD in humans in Wisconsin occurs annually at about the same rate of one case per million people as is found world-wide. Annual reported cases of CJD among Wisconsin's nearly 5 million inhabitants averaged 4.3 cases per year for the period 1991 to 2000 (high of 7 in 1993; low of 1 in 2000).
- \$ It has recently been reported in the news media that the CDC is investigating three hunters from Wisconsin and Minnesota who knew each other, and all died of neurological disorders (2 from CJD and one from Pick's disease - another neurological illness). All three individuals were over 55 years of age, the usual age range of those afflicted with CJD. This observation is currently being investigated to determine if there is any link between the consumption of game and these illnesses.

How Can any Potential Food Safety Risk Be Minimized? With the current state of information about CWD in deer and venison safety, there are at least three predictable reactions from hunters and processors:

- \$ Some will accept that the risk is extremely low, and choose to hunt and process venison as in the past.
- \$ Some will view the risk as significant, and choose to not hunt or process venison in 2002.
- \$ Many will view the risk as acceptable but would like to take some precautions or "go the extra mile" in reducing any potential risk to its lowest possible level. For these persons, the following recommendations from various agencies and experts can be considered:
 - a. As always, do not process or consume venison from a deer which appears unhealthy in any way (emaciation, visible infections, other outward signs or abnormalities).
 - b. Prevent entry of brain, spinal cord or lymph nodes into venison which will be consumed.
 - c. Do not cut into the brain or spinal cord. Bone-out the deer without cutting through the backbone.
 - d. Wear rubber or latex gloves when handling raw venison. This is a good practice for handling venison even without the CWD issue.
 - e. Thoroughly clean knives and equipment after use with a warm detergent solution to effectively remove protein materials. Rinse or soak equipment in a 50/50 solution of bleach and water after cleaning (strong chlorine solutions have been shown to greatly decrease the infectivity of prions - allow to soak for one hour).

What About Consuming Venison from Deer Taken in the Intensive Management Zone?

There are differing opinions on this question. Although this is the area where CWD has been found, only about 3% of the animals harvested there have been positive. Some conservative opinions advise not to consume venison from any deer taken within this zone. If one accepts the current state of knowledge that CWD cannot be transferred to humans, and if recommended precautions are followed, then the use of venison from healthy-appearing animals harvested in the zone may seem reasonable. The Food Safety Division of the Wisconsin Department of Agriculture, Trade and Consumer Protection suggests that venison from healthy-appearing animals harvested in this zone be handled separately (individually). Most deer taken in this area will be included in the DNR's surveillance testing program, so waiting for results of those tests before deciding what to do with the product from their deer might be another option for hunters.

What About Testing Deer for CWD? Currently, the most reliable test for the presence of CWD in deer involves using a microscope to examine thin slices of brain or lymph node which have been stained to show the presence of the infectious prions. In order for this staining technique to be effective, deer heads must be placed under refrigeration within 12-18 hours of harvest (depending on weather conditions), and the brain tissue then processed within the next 36 hours. Longer times or greater temperature abuse of the brain tissue can lead to inconclusive test results. This test can only confirm the presence or absence of CWD in a deer. It is an animal health test and not intended to determine the safety of the venison. Additionally, the test may not detect animals recently infected.

At this writing it appears that there will be little opportunity for individual hunters on their own to have their deer tested for the presence of CWD. Current laboratory capabilities within the state may be fully utilized in DNR surveillance testing of up to 500 deer per county (35,000 to 50,000 across the state), to better define the location of CWD within the state. Hunters whose deer are sampled in this program will have the opportunity to find out if their animal tested positive for CWD, but those results will not be available for several months.

Can a Processing Plant Become “Infected” with CWD? If a plant handles venison, does that pose a significant risk of build-up of infectious prions within the plant environment, which could affect other meat products? That question is impossible to answer with absolute certainty at this time, but it seems unlikely for the following reasons:

- § Venison from few, if any, CWD affected deer would be processed in any plant.
- § By not cutting into spinal cord or brain, and by removing lymph nodes, the suspected source of infectivity is not released into the plant environment. Prions are proteinaceous material, and are not airborne, nor do they grow in number or amount.
- § Thorough cleaning of plant equipment with a detergent to remove protein materials should eliminate most prions which could be present (prions are proteins). Meat inspection regulations require strict separation of inspected traditional meats from uninspected venison, including thorough cleaning and sanitizing of equipment.
- § Effective sanitizing of food contact surfaces with a strong 50/50 bleach and water solution has been shown to greatly reduce the infectivity of the prions.
- § If prions were adhering to equipment surfaces so tenaciously as to survive scrubbing with soapy water and a strong sanitizer, it seems unlikely they would transfer to future meat contacting the surface.

Evaluating the Risk: Everyone evaluates risks in life from their own unique perspective. Some people always wear seat belts in a car to reduce the risk of being injured or killed in an accident. Other people never wear seat belts because they feel the risk is not great enough to merit the discomfort of wearing them. You can think of plenty other similar risk-related examples.

The food safety risk from venison in the current Wisconsin situation is not nearly as clear cut as the seat belt situation above. Never-the-less many people will perceive venison processing or consumption as containing some amount of risk. Risk communication specialists have found that certain “outrage factors” associated with a situation will intensify people’s concern about the

magnitude of a risk. These factors include diseases that are regarded as “exotic,” poorly understood as to their cause and transmission, and have a “dreaded” health consequence, as well as situations where an individual has little personal control. The CWD risk has all those factors associated with it, increasing our awareness of any potential problem. Being struck by lightning, involved in an auto or plane crash, contracting food-borne illness or having a heart attack are all very real risks which definitely create harmful outcomes, but these may have less perceived risk (seem less threatening) than CWD because they are more common place and better understood.

What to Do? This article has reviewed current information surrounding the potential food safety aspects of venison in Wisconsin’s CWD situation. At this time the evidence suggests an extremely low risk, if any, associated with venison consumption. Absolute safety is not attainable in most life situations, including the current CWD situation. The risk of CWD passing to humans cannot be quantified and compared to other life risks because it has not yet been known to occur. Hunters and processors must individually weigh the current evidence and recommendations, consider the risk in the perspective of their life situations and take actions they feel appropriate. This and other articles suggest precautions which can be taken in handling and processing venison to minimize any risk which might exist. To keep up-to-date on any changes in CWD information and recommendations, check the DNR and WDATCP websites: <http://www.dnr.state.wi.us/org/land/wildlife/whealth/issues/cwd> <http://datcp.state.wi.us> Key word: chronic wasting disease

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